TUNKEL', Naum Ruvimovich; DRUINSKIY, David Isaakovich; KOKH,
      Petr Ivanovich; ZLOTIN, Vladimir Isaakovich; SVERLEL',
      I.S., kand. tekhn. nauk, dots., retsenzent; G GEL', I.B.,
      inzh., rotsenzent; GOL'DSHTEYN, A.G., inzh., retsenzent

[Maintenance based of strip mines] Remontrye bazy kar'erov.
Moskva, Izd-vo "Nedra," 1964. 269 p.   (MIRA 17:4)

DRUK, B.V.,

Effective wave lengths of some glasses used in pyrometry.
Steklostroenie no.9:4-5 S '65.

(MIRA 18:10)

SOURCE CODE:

ACC NR: AP7007586

AUTHOR: Stadnyk, B. I.; Gil', B. I.; Druk, R. V.

ORG: none

TITLE: High-temperature thermocouples for measuring the temperature of an oxidizing medium

SOURCE: Mekhanizatsiya i avtomatizatsiya upravleniya, no. 2, 1966, 45-49

TOPIC TAGS: thermocouple, thermometer

SUB CODE: 13

ABSTRACT: Thermocouples and resistance thermometers (contact measurement method) are used for achieving increased accuracy in measurements of high temperatures required in modern technological processes.   The resistance thermometers presently manufactured may not be used for measuring temperatures above 650°C. The upper temperature limit for thermocouples lies considerably below the melting point of the thermal electrodes due to oxidation of the electrodes themselves, vaporization and diffusion of the metals in the hot junction, and chemical interaction between the ambient medium and the protective material of the thermal electrodes, the ambient medium and the protective ceramic.   The PR-13/1 thermocouple has a high rhodium content in the positive electrode and the thermoelectromotive force of the unit is more than

UDC:

ACC NR: AP7007536

10% higher than that of the PR-10/0. The PR-30/6 thermocouple is used for measuring temperatures up to 800°C. The positive thermal electrode in this unit is made from platinum plus 30% rhodium, while the negative electrode is made from platinum plus 6% rhodium. The PR-20/5, PR-30/6 and PR-40/10 thermocouples are used for brief temperature measurements up to 800°C, but are designed principally for replacing the PR-10/1 thermocouple in the 1500-1700°C range since they are more resistant to external effects and chemical contamination and show an error of less than 4°C even after 5 hours of operation at 1600-1800°C. The PR-40/20 thermocouple shows the same error level in measuring temperatures up to 850° in an oxidizing atmosphere (air), but its sensitivity is only one half that of the PR-20/5, PR-30/6 and PR-40/10 units and, in addition, requires individual calibration. PR-10/0 thermocouples, which have been approved as standard instruments for the International Temperature Scale from 630 to 1063°C with an accuracy of ±0.1°C, are used for measuring temperatures up to 1200°C, and at a lower accuracy (±6°C) -- to a temperature of 1600°C. Thermocouples with thermoelectrodes made from iridium-rhodium alloys paired with iridium may be used for measuring the temperature of oxidizing media up to 2000°C. The most stable unit of this type is a thermocouple of iridium plus 60% rhodium paired with pure iridium (Ir+60% Rh/Ir). The thermoelectromotive force of the thermocouple is a linear function of temperature which facilitates calibration and interpolation. A thermoelectromotive force of about 11 mv is developed at a temperature of 2000°C, and measurements may be made at this temperature with satisfactory accuracy for 10-20 hours. Pencil

Card 2/3

DRUKAREV, G. F.

Correction to the paper by G. F. Drukarev on the phase distribution of the wave function with Coriolis variation

Source: Experimental'noi i Teoreticheskoi Fiziki

20, 11, 1940, 1056

FROM: D.S.I.R. Trans. com. List of Refer. No. 31, Oct. 1951, p. 81

[illegible faded text]

BUGAYENKO, B. F.

Institute of Theoretical Geophysics, Acad. of Sci., (?-----)

"On the Theory of Waves of Rain Drops. II,"

Iz. Ak. Nauk SSSR, Ser. Geograf. i Geofiz., No. 2, 1948

SHOLENSKY, L. F.

Acad. Sci., Inst. Theor. Geophysics (-1949-)

"Temperature and distribution with height of the electrons in the ozone,"

Iz. Ak. Nauk SSSR Geograf. i Geofiz., No. 5-6, 1945.

U. E

2071
517.30? 551.510.535
On the Mean Energy of Electrons released in the Ionization of Gas. G. Dhukatev. *(Zh. eksp. i teor. fiz., vol. 16, No. 6, pp. 484 etc. In Russian with English summary.)* As an electron released by ionization gives up its energy during a large number of collisions, the mean energy of the electrons is larger, under certain conditions, than the thermal energy of the remainder of the gas. The conditions under which the electrons may be regarded as a gas having a temperature are considered, a formula for this temperature is derived, and applied to the ionosphere. An English version appears in *J. Phys., U.S.S.R., 1946, vol. 10, No. 1, pp. 51-54.*

SA

4547

548.0 : 535.327 *see Abstr.* 2479
548.0 : 535.66 : 537.531
On the theory of crystal coloration by X-rays. Dav-   2687
KAREV, O. P. *C.R. Acad. Sci., URSS,* 53 (*No.* 3) 215-17

(1946).—A "hole" theory is developed. A potential well
is essential for the formation of a centre of light absorp-
tion, and the well is formed in the place where a negative
ion is ejected by thermal vibration. It is shown that
sufficiently hard X-rays can themselves form holes in the
lattice.   — L. S. O.

DRUKAREV, G. F.

USSR/Physics
    Wave Mechanics
    Mathematics, Applied

Mar 49

"Determining the Phase of a Wave Function During
the Scattering of Particles," G. F. Drukarev,
Phys Inst, Leningrad State U, 4 pp

"Zhur Eksper i Teoret Fiz" Vol XIX, No 3,
pp 246-50.

Proposes new method to calculate phase of wave
function during scattering. Phase is defined as
asymptotic value of a certain auxiliary function
which satisfies a nonlinear differential
equation of the first order. Method gives more
equation of the first order. Method gives more
                        32/49T101

USSR/Physics (Contd)   Mar 49

accurate value of phase than method based on
numerical integration of Schroedinger's equation.
Submitted 7 Oct 48.

32/49T101

eA

A52

7863.   Determination of the phase of the
function in particle scattering corrections. 530.145.6
DRUKAREV—J. Exp. Theor. Phys., USSR. 20, 1056
(Nov., 1950) In Russian.
See Abstr. 5258 (1949).

ASM-SLA   METALLURGICAL LITERATURE CLASSIFICATION

DRUKAREV, G. F.

PA 174T50

USSR/Nuclear Physics - Potential
Barrier   Jan 51

"Theory of the Passage of Particles Through the
Potential Barrier," G. F. Drukarev, Leningrad
State U

"Zhur Eksper i Teoret Fiz" Vol XXI, No 1,
pp 59-68

Considers problem of emergence of particle from
surrounding spherically sym potential barrier
as nonstationary problem in quantum mech. In-
vestigates in detail wave function outside bar-
rier. In particular shows that if particle is

USSR/Nuclear Physics - Potential
Barrier   Jan 51
(Contd)

Initially located within barrier in one of
quasistationary states then its wave-function
modulus outside barrier grows exponentially
with distance for $r < vt$ and drops sharply
for $r > vt$ and tends to zero for $r \to \infty$.

174T50

17'

USSR/Universities - Sessions

"Annual Scientific Session of Leningrad University in 1951," P. G. Makarov,
T. A. Agekyan, G. Drukarev, N. Yenovskaya, O. V. Golodnikov, and S. M. Ariya

Feb 52

Vest Leningrad U, Ser Mat, Fis, Khim, Vol 7, No 2, pp 184-190

The annual scientific session of Leningrad University took place 4-20 Feb 1952.
The Math Section was subdivided into math, mechanics, and astronomy; the physics
comprised also geophysics. The chemistry section dealt also with cooperation
with industry.

PA 251798

USSR.

464.   On the theory of the collision of electrons with hydrogen atoms. G. F. Drukarev, *Zh. eksper. teor. Fiz.*, 25, No. 2(8) (in Russian).

The procedure for treating exchange effects outlined by Mott and Massey is criticized in that only outgoing waves are chosen at one point in the calculation with exchange functions, whereas going by way of Volterra integral equations this choice seems to be impossible. A procedure of generalizing Fock's treatment of exchange effects to atomic collisions is outlined. The wave-function is expressed as an anti-symmetrized sum over α of products of $\psi_\alpha(r_i)$, the eigensolution of the nucleus plus one electron system (in a bound continuum state) and $f_\alpha(r_j)$, the eigensolution of the nucleus plus incident electron system. The interaction between the electrons couples various terms of this sum. The dependence on α can be integrated out and a series of coupled integro-differential equations are obtained on $f_\alpha(r_j)$.

G. E. BROWN

USSR.

465. Application of the integral equations for calculation of the effective cross section for collision of electrons with atoms. G. F. Drukarev. Zh. eksp. teor. Fiz., 25, No. 2(8) 139-46.

The formalism of the paper reported in the preceding abstract is applied to calculation of the cross section for excitation of the 2S electron in hydrogen. The energy of the incoming electron is small enough so that only one level of the atom can be excited, and consequently only two different $f_i(r_j)$ need be chosen, one representing something like the incident wave, and the other a scattered wave (although both contain ingoing and outgoing waves). The system of equations can be changed into a Volterra equation of second type with auxiliary algebraic equations. This form is convenient for studying the asymptotic behaviour of the functions.

G. E. BROWN

DRUKAREV, G.F.

SUBJECT	USSR / PHYSICS
AUTHOR	DRUKAREV,G.F.
TITLE	The Spatial Distribution of the Electric Charge and the "Electric Radius" of Heavy Nuclei.
PERIODICAL	Usp.fis.nauk, 60, fasc. 3, 391-412 (1956)

CARD 1 / 2

PA - 1750

Issued: 12 / 1956

For the investigation of the distribution of the charge such phenomena are suited in which the electromagnetic interaction of the particles plays the most important part and where the influence of finite nuclear dimensions manifests itself with sufficient distinctness. Such phenomena are: 1.) Scattering of electrons with an energy that far surpasses the rest energy of electrons. 2.) The COULOMB energy of heavy particles. 3.) The effects of the fine structure of Roentgen terms. 4.) The isotope shift in atomic spectra. 5.) The spectrum of the X-rays emitted by negative myons on the occasion of transitions between the steady states of heavy mesoatom-. Here some new investigations carried out in connection with these effects are discussed.
The theory of the scattering of electrons by a nucleus: BORN'S approximation applies only in the case of small Z, while at large Z it leads to grave errors. The number of electrons scattered within a given angle of space probably diminishes as against scattering on a point charge. The mathematical influence exercised by the smearing out of the charge manifests itself in form of a modification of the expression for the differential cross section $\sigma(\theta)$. At high energies the form factor no longer depends on a parameter, but also on the form of the charge density ϱ. Next, the causes of the difference between

DRUKAREV, G. F. Doc Phys-Math Sci -- (diss) "Studies on the theory of collisions of slow electrons with atoms." Len, 1957. 12 pp 20 cm. (Len Order of Lenin State Univ im A. A. Zhdanov), 100 copies. (KL, 15-57, 104)

-1-

AGLINTSEV, Konstantin Konstantinovich; DRUKAREV, G.F., red.; ORLOVA, L.I.,
red.; VOLCHOK, K.M., tekhn.red.

[Dosimetry of ionizing radiations] Dosimetriia ioniziruiushchikh
izluchenii. Izd. 2-oe, perer. Moskva, Gos. izd-vo tekhniko-
teoret. lit-ry, 1957. 503 p.   (MIRA 11:3)
        (Radioactivity--Measurement)

AUTHOR: DRUKAREV,G.F.   PA - 2977
TITLE: The Dependence of the Cross Section of the Non-Elastic Scattering
            of Particles upon the Energy near the Threshold Value. (Zavisimost'
            effektivnogo secheniya neuprugogo rasseyaniya chastits ot energii
            vblizi poroga, Russian).

ABSTRACT: The present paper describes the manner in which this investigation
            was carried out. For purposes of illustration the author here examines
            the most simple systemA, which consists of an immobile power center
            and a particle a, which is coupled with it. This system is assumed
            to be approached by a particle b. For the purpose of avoiding com-
            plications connected with the PAULI principle the particles a and b
            are assumed to be different.

            Here the non-elastic scattering of b is of interest, by which a
            changes over from a certain state with the energy E_0 into another
            state with the energy E_1. By development of the wave function of the
            system A + b $\Psi(r_1 r_2)$ according to the eigenfunctions $\Psi\alpha$ of the system A,
            $\Psi(\vec{r}_1 \vec{r}_2) = \sum_\alpha \Psi_\alpha(\vec{r}_1) F_\alpha(\vec{r}_2)$ results, and the system of equation
            $\Delta F_\alpha + k_\alpha^2 F_\alpha = \frac{2}{\hbar} V_{\alpha\beta} F_\beta$ with the asymptotic conditions

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The Dependence of the Cross Section of the Non-Elastic   PA - 2977
Scattering of Particles upon the Energy near the Threshold Value.
$F_\alpha \sim \exp(i\vec{k}_\alpha \vec{r}_\alpha)\delta_{\alpha o} + q_\alpha r^{-1}\exp(ik_\alpha r)$ is obtained for F_α. The cross section
of the transition 0   is connected with the amplitude q by the
relation $\sigma_{o\alpha} = (k_\alpha/k_o)\int |q_\alpha|^2 d\Omega$.
The author examines the system of equations $\Delta F_\alpha + k_\alpha^2 F_\alpha = \sum_\beta V_{\alpha\beta}F_\beta$ in
an approximation in which two equations for F_0 and F_1 may be separated
and the connection of these equations with the other equations may be
neglected. In this case $(\Delta + k_0^2)F_0 = V_{oo}F_0 + V_{o1}F_1$, $(\Delta + k_1^2)F_1 =$
$= V_{11}F_1 + V_{10}F_0$ applies. Here only the most simple case of the
transition between s-states, and, besides, only the s-states of the
scattered particles b are dealt with. F_1 and F_2 then are spherically-
symmetrical. The system of equations corresponding to this case can be
reduced to the form of integral equations. By confining ourselves to
terms of not more than the second order, we obtain, after some com
putations, the following cross section:

$$\sigma = 4\pi \frac{k_1}{k_0} a_1 \cdot \frac{1 + a_2 k_1^2}{1 + a_3 k_1 + a_4 \varkappa_1 + a_5 \varkappa_1^2 + a_6 \varkappa_1 k_1 + a_7 k_1^2}$$

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24(5)

AUTHOR: Drukarev, G. F.   SOV/54-58-4-7/18

TITLE: Approximation Expressions for the Amplitude of the Scattering of
                 Slow Electrons by Atoms (Priblizhennyye vyrazheniya dlya
                 amplitudy rasseyaniya medlennykh elektronov atomami)

PERIODICAL: Vestnik Leningradskogo universiteta. Seriya fiziki i khimii,
                 1958, Nr 4, pp 65-74 (USSR)

ABSTRACT: In this paper the authors established a relation between the
                 known approximation expressions for the scattering amplitude of
                 1) the approximation of Born and Born-Oppenheimer according to
                 the perturbation theory and 2) of the expressions according to
                 the method of integral equations. If only the scattering of slow
                 electrons is taken into account, one may restrict oneself to the
                 investigation of one partial amplitude of the scattering which
                 corresponds to a zero orbital angular momentum. First, the au-
                 thor investigated the problem of the elastic scattering of elec-
                 trons on atoms, not taking into account exchange effects and
                 polarization of the atom by the incident electron. The radical
                 wave function describing the electron scattering satisfies equa-
Card 1/3   tion (1), which, under the given conditions (2), is equivalent

Approximation Expressions for the Amplitude of the Scattering of Slow Electrons
by Atoms

to the integral equation f[r] (3). The expression q for the
scattering amplitude was found according to (3) at r —∞ and the
conditions (2). In order to obtain an approximate expression for
q, f(r) is expanded in a series of powers of λ (λ is a parameter
for characterization of the field strength), whereby also a
series is obtained for q (which holds only for small values of
λ). By the second way the equation (3) with f = cx is transformed
into an integral equation (Ref 1). The transformed integral equa-
tion for x is expanded again in a series and q is found as a
fraction of two series of the powers of λ (in this case for any
values of λ). The approximate expression is again obtained by
breaking off the series after an arbitrary term. A comparison of
the approximate expressions for q obtained by both ways shows
that the zero approximation of both ways is equal. Further, the
author investigated the amplitude scattering taking into account
the exchange effects. Mention is made of the fact that the afore-
said method of solving the approximate expression of the ampli-
tude scattering may be applied to an orbital momentum $\neq$ 0 and to
the inelastic scattering in a similar manner. The numerical com-

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Approximation Expressions for the Amplitude of the Scattering of Slow Electrons by Atoms

SOV/54-58-4-7/18

putations of the integrals were made by V. E Brattsev and L. Yevseyenkova, Laboratory Assistants of the Chair of Theoretical Physics LGU. There are 3 references, 2 of which are Soviet.

Card 3/3

$.I2/14$

DRUKAREV, G.F.

Theory of atomic excitation by electrons. Fiz.sbor. no.4:97-99 '58.   (MIRA 12:5)

1. Fizicheskiy institut Leningradskogo ordena Lenina gosudar-stvennogo universiteta imeni A.A.Zhdanova.
                    (Atoms)   (Electrons)

NOVOZHILOV, Yuriy Viktorovich; DRUKAREV, G.F., red.; SPERANSKAYA, O.V.,
    tekhn.red.

    [Elementary particles] .Elementarnye chastitsy. Moskva, Gos.
    izd-vo fiziko-matem.lit-ry, 1959. 184 p.   (MIRA 12:8)
                (Particles, Elementary)

21 (7)

AUTHOR: Drukarev, G. F.   SOV/56-37-3-38/52

TITLE: On the Massey-parameter in the Theory of Atomic Collisions

ABSTRACT: The recently obtained experimental material concerning the
            capture of electrons in collisions between atoms and ions
            (Fogel' et al.)(Refs 2,3) fits well into Massey's so-called adi-
            abatic hypothesis. The cross section is determined by means of
            the parameter $|\Delta E|a/hv$, where $|\Delta E|$ is the variation of internal
            energy in the collision, v - the relative velocity of the
            atoms before the collision, and a - a length of the order of
            magnitude of atomic dimensions. If $a|\Delta E|/hv \gg 1$, the cross
            section is small if the process develops adiabatically. With
            an increase of velocity the cross section increases and at-
            tains a maximum at $|\Delta E|a/hv \sim 1$. With a further increase of v
            the cross section falls again. If a is determined from the
            equation $a = hv_m/|\Delta E|$ (v_m is the velocity at which the cross
            section is a maximum), it is found that the numerical value
            of a is determined by the nature of the process, and hardly

Card 1/3

On the Massey-parameter in the Theory of Atomic   SOV/56-37-3-38/62
Collisions

depends on the nature of the colliding particles (e.g. for the capture of two electrons: $a \sim 1.5$ $\AA$). For the investigation of the physical significance of a the author investigates the known equation $q(\theta) = |\vec{p}_0 - \vec{p}| = \left[(\Delta E/v)^2 + 4p_0^2 \sin^2(\theta/2) \right]^{1/2}$. $q(\theta)$ is the momentum transmitted during a scattering at an angle θ in the c.m.s., $\vec{p}_0$ and $\vec{p}$ are the momenta of the particles before and after the collision. Further, $(p_0^2 + p^2)/2m = \Delta E$ and $|\vec{p}_0 - \vec{p}| \ll p_0$. In the case of forward scattering at a small angle ($0 \leq \theta \ll |\vec{p}_0 - \vec{p}|/p_0$) the momentum $q(0) = |\Delta E|/v$ is transmitted. At $v = v_m$ q_m is $|\Delta E|/v_m$. One thus obtains $a = h/q_m$, i.e. a is inversely proportional to the most probable momentum transmitted in the collision. The conclusions resulting herefrom are briefly discussed. The numerical value of a results from the fact

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On the Massey-parameter in the Theory of Atomic   SOV/56-37-3-38/62
Collisions

that q_m is of the order of $\hbar/a_0$ (a_0 is Bohr's radius). The adiabaticity condition is $q \gg \hbar/a_0$. The author thanks Ya. M. Fogel' for discussions. There are 4 references, 2 of which are Soviet.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk SSSR (Leningrad Physico-technical Institute of the Academy of Sciences, USSR)

SUBMITTED: May 7, 1959

Card 3/3

AUTHORS: Sena, L. A.,   Drukarev, G. F.

TITLE: First All-Union Conference on Electron- and Ion Collisions

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960,
                Vol. 24, No. 8, pp. 941-942

TEXT: From June 26 to July 3, 1959 the First All-Union Conference on Elec-
tron and Ion Collisions which had been organized by the Akademiya nauk
Latviyskoy SSR (Academy of Sciences of the Latviyskaya SSR) took place in
Riga. It was attended by representatives of scientific research institutes,
schools of higher learning, and works in Moscow, Leningrad, Kiyev, Khar'kov,
Tomsk, Riga, and other towns of the USSR. The main subjects of discussion
were the inelastic collisions between electrons, atoms and molecules as well
as processes taking place in heavy-particle collisions. L. A. Vaynshteyn
opened the Conference with a lecture "General Theory of the Collisions of
Electrons With Atoms" (see article by L. A. Vaynshteyn and I. I. Sobel'man
on pp. 943-945 of the present periodical). - R. Ya. Damburg and V. Ya.
Kravchenko spoke about "Estimation of the Effective Scattering Cross Sections

Card 1/4

First All-Union Conference on Electron- and Ion   • S/048/60/024/008/001/017
Collisions   B012/B067

of Electrons in Alkali Atoms by Taking Into Account Strong Coupling",
V. Ya. Vel'dre and R. Ya. Damburg - "On the Selection of the Wave Functions
in the Scattering Problem", R. K. Peterkop on "Partial Excitation Cross
Sections of the Hydrogen Atom", L. A. Vaynshteyn and G. G. Dolgov - "On
the Calculation of the Excitation Cross Sections of Atoms Due to Electron
Impact by Means of Electronic Computers". Yu. N. Demkov spoke about the
variation methods in the theory of collisions. I. P. Zapesochnyy and S. M.
Kishko spoke about "The Functions of the Excitation of Nitrogen and Carbon
Monoxide Molecules in Collisions With Electrons", I. P. Bogdanova on "Experi-
mental Study of the Excitation Curve of Spectral Lines of the Atoms",
V. Ye. Yakhontova on "Experimental Determination of the Excitation in Helium
Lines of the Series $2^1S - n^1P$ Due to Electron Impact", L. M. Volkova and
A. M. Devyatov - "On the Excitation Cross Sections of Spectral Lines of Some
Inert Gases and Metals", M. V. Gur'yev, M. V. Tikhomirov, and N. N. Tunitskiy
on "Dissociation of Large Molecules in Electron Impact", N. V. Fedorenko on
"Ionization in Collisions Between Ions and Atoms". The experimental inves-
tigations made into this field conducted at the Leningradskiy fiziko-tekhni-
cheskiy institut (Leningrad Physico-technical Institute) were reported by:

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First All-Union Conference on Electron- and Ion   S/048/60/024/008/001/017
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Yu. F. Bydin and A. M. Bukhteyev "Ionization of Fast Sodium-, Potassium-, Rubidium-, and Cesium Atoms in Collisions With Hydrogen-, Deuterium-, Nitrogen-, and Oxygen Molecules", L. G. Filippenko and I. P. Flaks "Scattering of Multiply Ionized Ions Accompanied by Electron Capture", I. P. Flaks and L. G. Filippenko "Ionization of Inert Gases by Doubly and Triply Charged Ions", V. V. Afrosimov, R. N. Il'in, and Ye. S. Solov'yev "Ionization of Argon Under Formation of Multiply Charged Ions". - N. V. Fedorenko and V. A. Belyayev spoke about "Maximum Cross Section of a Nonresonance Single Electron Charge Exchange", A. M. Bukhteyev and Yu. F. Bydin on "Resonance Charge Exchange of Ions and Atoms of the Alkali Metals", D. V. Chkuaseli, U. D. Nikoleyshvili, and A. I. Guldamishvili on "Resonance Charge Exchange of Positive Ions of the Alkali Metals", R. M. Kushnir and I. M. Buchma on "Further Studies of Resonance Charge Exchange of Positive Cesium Ions", V. L. Tal'roze on "Elementary Processes in Collisions Between Slow Ions and Molecules". The following lectures dealt with the investigations conducted at the Khar'kovskiy fiziko-tekhnicheskiy institut (Khar'kov Physico-tecِ-nical Institute): Ya. M. Fogel' "Ionization in Collisions Between Ions and Atoms". - Ya. M. Fogel', V. A. Ankudinov, and D. V. Pilipenko "Electron

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First All-Union Conference on Electron- and Ion   S/048/60/024/008/001/017
Collisions   B012/B067

Losses of the Fast Atoms in Single Collisions With Gas Molecules", Ya. M.
Fogel', A. G. Koval', and Yu. Z. Levchenko "Ionization o· t·? Gas Atoms in
the Collision With Negative Hydrogen Ions". Ya. M. Fogel' analysed the
results of these investigations and showed that the rules governing the
formation of negative ions fit well into the framework of the adiabatic
hypothesis of Massey.. The lecture delivered by G. F. Drukarev dealt with
the problem of explaining this hypothesis. G. F. Drukarev also spoke about
"Modern Methods of Calculating the Cross Sections in Atomic Collisions".

Card 4/4

82834
S/049/60/024/008/011/017
B012/B067

24.6100

AUTHOR: Drukarev, G. F.

TITLE: Modern Methods of Calculating the Collision Cross Sections
               of Atoms

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960,
               Vol. 24, No. 8, pp. 979-985

TEXT: On the basis of Refs. 1,2,4 a survey is given here on the modern
methods for calculating the atomic collision cross sections. It is
pointed out that, as is shown by D. R. Bates and McCarroll (Ref. 1),
the method of the excited steady states, in using the semiclassical
nuclear functions, is actually equivalent to the parametric method.
First, the most simple process in which only the state of an electron is
changed is studied. The wave function of the electron, formula (14), is
deduced. For approximation calculations a finite number of the summands
in formula (14) is used. In this case formula (14) of Schrödinger
equation (13) is not sufficient, however, it may be sufficient for

Card 1/2

S/208/61/001/006/012/013
B125/B112

AUTHOR: Drukarev, G. F. (Leningrad)

TITLE: The method of the tentative potential for determining the
             wave functions of the continuous spectrum

PERIODICAL: Zhurnal vychislitel'noy matematiki i matematicheskoy fiziki,
             v. 1, no. 6, 1961, 1133 - 1136

TEXT: A particle with an energy $E > 0$ moves in a central field of force
with a potential energy $U(r)$, which, when r tends to infinity, decreases
more rapidly than $1/r^2$. The wave function of the particle satisfies the
equation $\Delta\psi + (k^2 - V)\psi = 0$ (1) with $k^2 = (2m/\hbar^2)E$ and $V = (2m/\hbar^2)U$ (2).
If r is much greater than r_0 (r_0 = radius of action of the field of force),
then the following asymptotic expression will be valid:
$\psi \sim e^{ikr\cos\theta} + q(\theta)e^{ikr}/r$. By a proper formulation of the potential V_0
(for which Eq. (1) has a sufficiently simple solution) one obtains an
approximate wave function ψ_0. The difference $V - V_0$ is regarded as a
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The method of the tentative potential...   S/208/61/001/006/012/013
B125/B112

small perturbation, and V_0 is chosen such that $\int (V - V_0)\psi_0^2 \, dr = 0$ (4). At zero energy, ψ satisfies the equation $\Delta\psi - V\psi = 0$ and is approximately equal to $1 + (q/r)$ (6). Accordingly, one finds $\Delta\psi_0 - V_0\psi_0 = 0$ (7) and $\psi_0 = 1 + (q_0/r)$ (8). $q = q_0$ is valid in first approximation, and $V - V_0$ is a small perturbation if $\int_0^\infty |V - V_0| r \, dr \ll 1$ (13). If conditions (4) and (13) are valid, one obtains a good approximation not only at zero energy but also in a certain interval k. The validity of these conditions is demonstrated by the example of the electron wave function in the field of a hydrogen atom. V. A. Fok is thank for a discussion, and V. A. Baykov for numerical computations. There are 1 table and 3 references: 1 Soviet and 2 non-Soviet. The reference to the English-language publication reads as follows: M. Seaton. The application of variational methods to atomic scattering problems. Proc. Roy. Soc., 1957, A241, 522 - 530.

SUBMITTED: June 14, 1961

Card 2/2

FRISH, S.E., otv. red.; BOBOVICH, Ya.S., kand. fiz.-matem. nauk, red.;
VOL'KENSHTEYN, M.V., doktor fiz.-matem. nauk, red.: GALANIN,
M.D., doktor fiz.-matem. nauk, red.; DRUKAREV, G.F., doktor
fiz.-matem. nauk, red.; YEL'YASHEVICH, M.A., akademik, red.;
KALITEYEVSKIY, N.I., doktor fiz.-matem. nauk, red.; KUSAKOV,
M.M., doktor khim. nauk, red.; LIPIS, L.V., doktor tekhn.nauk,
red.; PEKAR, S.I., doktor fiz.-matem. nauk, red.: PROKOF'YEV,
V.K., doktor fiz.-matem. nauk, red.; SOKOLOV. N.D., doktor
fiz.-matem. nauk, red.; FEOFILOV, P.P., doktor fiz.-matem.
nauk, red.; CHULANOVSKIY, V.M., doktor fiz.-matem. nauk, red.;
SHPOL'SKIY, E.V., doktor fiz.-matem. nauk, red.; YAROSLAVSKIY,
N.G., kand. fiz.-matem. nauk, red.; LEKSINA, I.Ye., red. izd-
va; PENKIN/, N.V., red. izd-va; NOVICHKOVA, N.D., tekhn. red.;
KASHINA, P.S., tekhn. red.

[Physical problems in spectroscopy]Fizicheskie problemy spektro-
skopii; materialy. Moskva, Izd-vo Akad. nauk SSSR, Vol.1. 1962.
474 p.   (MIRA 16:2)

1. Soveshchaniye po spektroskopii. 13th, Leningrad, 1960. 2. Chlen-
korrespondent Akademii nauk SSSR (for Frish). 3. Akademiya nauk
Belurusskoy SSR (for Yel'yashevich).
                    (Spectrum analysis)

NOVOZHILOV, Yuriy Viktorovich; DRUKAREV, G.F., red.; LUK'YANOV, A.A.,
        tekhn. red.

    [Elementary particles] Elementarnye chastitsy. Izd.2., dop.
    Moskva, Fizmatgiz, 1963.   204 p.   (MIRA 16:9)
        (Particles (Nuclear physics))

AM4033671   BOOK EXPLOITATION   S/0792

Drukarev, Grigoriy Filippovich

Theory of collisions of electrons with atoms (Teoriya stolknoveniy elektronov s
    atomami) Moscow, Fizmatgiz, 1963. 219 p. illus., biblio. 5000 copies printed.
    Editors: Demkov, Yu. N.; Andrushchenko, A. S.; Technical editor: Luk"yanov,
    A. A.; Proofreader: Lyubovich, L. A.

TOPIC TAGS: Collision theory, electron atom collision, particle scattering,
force center, wave function, scattering amplitude, hydrogen atom collision,
elastic scattering, hydrogen atom excitation, helium ion collision, helium atom
collision, sodium atom collision, multicharged ion

PURPOSE AND COVERAGE: This book is devoted mainly to questions pertinent to the
newest development of the theory of atom-electron collisions. Both the general
theory and its application to real problems are presented. The author expresses
his gratitude to Academician V. A. Fok and to Yu. N. Demkov and L. D. Faddeyev,
whose notations greatly improved the book.

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AM4033671

TABLE OF CONTENTS:

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ACCESSION NR: AT4001255   S/2668/63/000/013/0055/0065

AUTHORS: Drukarev, G. F.; Ob"edkov, V. D.

TITLE: The role of polarization effects in inelastic collisions of electrons with atoms

SOURCE: AN LatSSR. Institut fiziki. Trudy*, no. 13, 1963, 55-65

TOPIC TAGS: inelastic collision, nuclear collision, electron inelastic collision, polarization effect, polarized orbit method, polarized orbit, electron density distortion, atomic polarization

ABSTRACT: Equations are formulated for inelastic collisions with account of virtual transitions. The system of equations given by N. F. Mott and H. S. W. Massey (Theory of Atomic Collisions, Oxford, 1933, Chapter 8, Sec. 5) is a particular case of the equation derived here. To obtain the explicit form of the polarization potentials in the adiabatic approximation it is proposed to use a corresponding variational principle, and a simple computation formula, obtained with variation of one parameter, is presented by way of an example. The dependence of the excitation cross section when the energy near

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threshold is then investigated. The results show that the polariza-
tion of the atom exerts an appreciable influence on the scattering
amplitude and excitation amplitude at low energies of the incoming
and elastically-scattered particles, respectively. It is shown
that when the particle energy approaches the threshold of a new
channel the polarization potential should be non-additive in this
region. This imposes a limit on the applicability of the results
for elastic scattering, and the strong-coupling approximation should
be used near threshold. Orig. art. has: 42 formulas.

ASSOCIATION: Leningradskiy gosudarstvenny*y ordena Lenina Univer-
sitet im. A. A. Zhdanova (Leningrad State "Order of Lenin" Univer-
sity)

SUBMITTED: 00   DATE ACQ: 10Dec63   ENCL: 00

SUB CODE: PH, NS   NO REF SOV: 003   OTHER: 007

Card 2/2

DRUKAREV, G.F.

Adiabatic approximation for degenerate or almost degenerate states.
Zhur. eksp. i teor. fiz. 45 no.5:1484-1492 N '63.   (MIRA 17:1)

1. Leningradskiy gosudarstvennyy universitet.

BUNAKOV, B. Ye.; DRUKAREV, G. F.

"Nucleonic Clusters and the Shell Model."

report submitted for All-Union Conf on Nuclear Spectroscopy, Tbilisi,
14-22 Feb 64.

Leningrad State Univ.

L 2215-66   EWT(1)   IJP(c)

ACCESSION NR: AP5019239   UR/0056/65/049/001/0257/0264

AUTHORS: Demkov, Yu. N.; Drukarev, G. F.

TITLE: Particle of low binding energy in a magnetic field

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 1, 1965, 257-264

TOPIC TAGS: ion interaction, diamagnetism, particle interaction, potential well

ABSTRACT: This is a continuation of an earlier paper by the authors (ZhETF v. 47, 918, 1964), in which they considered a particle in a potential well of small radius (negative ion) situated in a strong electric field. The present article deals with the same system, but in a uniform magnetic field. The case of a shallow potential well is first considered, where there is no bound state in the absence of the field. It is then proved that, for an arbitrary shallow three-dimensional well, a bound state always appears when an arbitrarily weak field is switched on. In first approximation the binding energy is

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proportional to the square of the field, so that this phenomenon is
reminescent of diamagnetism, but acts in the opposite direction. The
magnetic field has a stabilizing influence on the particle, but real
magnetic fields are too weak for such an effect to be observable with
free atoms or electrons. It is shown, however, that for semiconduc-
tors at liquid-helium temperature and for electrons or holes with low
effective masses the binding energy becomes comparable with kT, so
that the bound state produced may be observed experimentally. If the
potential well is sufficiently deep, so that there is a bound state in
the absence of the magnetic field, there is the usual diamagnetic
effect, which increases the total energy by an amount proportional to
the square of the field and leads to expulsion of the system from the
field. The binding energy of the particle increases with the field,
so that the magnetic field again exerts a stabilizing influence on
the particle. 'We thank A. G. Zhilich and A. V. Tulub for valuable
discussions.' Orig. art. has: 1 figure and 38 formulas.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet (Leningrad
State University)

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L 2215-66
ACCESSION NR: AP5019239

SUBMITTED: 27Jan65   ENCL: 00   SUB CODE: NP, EM

NR REF SOV: 004   OTHER: 001

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L 5335-66   JvT(m)   DIAAP
ACCESSION NR: AP5021135   UR/0056/65/049/002/0691/0698
                                                         28
AUTHORS: Demkov, Yu. N.; Drukarev, G. F.   24
                                                             8
TITLE: Second-order poles of the S matrix and resonance scattering
                                                                19
SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49,
no. 2, 1965, 691-698

TOPIC TAGS: S matrix, resonance scattering, particle scattering,
moving pole method

ABSTRACT: The scattering of particles by a central force field with
a finite range is considered, under the assumption that the particles
are slow, so that only the partial wave with zero angular momentum
need be taken into account. The general pattern of the motion of the
poles of the S matrix on the unphysical sheet of the complex plane of
the energy is investigated as the potential energy is varied, with
attention to the the transition from resonance scattering by the po-
tential well, when there is a level close to the limit of t. contin-
uous spectrum, to scattering when there is a quasistationary state,

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ACCESSION NR: AP5021135

for example in the case of a potential well surrounded by a barrier. The S matrix is represented in terms of a Jost funct'on and the conditions under which the zeroes of the Jost function coincide on the imaginary axis (corresponding to a second order pole of the S matrix) are discussed. It is shown that for a potential well with a barrier the second-order pole can lie near zero energy. Accordingly, for resonance scattering of low energy particles, it is necessary to use a two-pole approximation for the S matrix. Resonance scattering is also considered in the case in which two simple poles coincide or are close to each other. 'We thank V. A. Fock, L. V. Faddeyev, and G. V. Dubrovskiy for a discussion of the questions considered in this paper.' Orig. art. has: 2 figures and 25 formulas.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet (Leningrad State University)

SUBMITTED: 16Mar65   ENCL: 00   SUB CODE: NP, GP

NR REF SOV: 007   OTHER: 004

Card 2/2 hrl

ACC NR: AT6024378   SOURCE CODE: UR/0000/66/000/000/0069/0088

AUTHOR: Drukarev, G. F.

ORG: none

TITLE: Theory of atomic transitions

SOURCE: Teoriya zvezdnykh spektrov (Theory of stellar spectra). Moscow, Izd-vo Nauka, 1966, 69-88

TOPIC TAGS: celestial body, differential equation, integral equation, atomic transition, transition process, quantum mechanics, electromagnetic field, wave function, star, nebula, particle interaction, spectrum analysis

ABSTRACT: The state of matter in stars and nebulae can be determined from their spectral characteristics. The nature of spectra depends upon the processes occurring in celestial bodies. These processes are unknown and can be evaluated approximately using the probabilities of electron, ion, and atom interactions. Differential and integral equations treating the sum of oscillator strengths during various transitions in atoms and the excitation processes in collisions of electrons with atoms are used in the attempt to solve the problem of physical and chemical processes. If two particles in a limited spatial volume interact with each other, they may undergo transition from an initial state to a final state. The number of processes during the transition is proportional to the number of particles and the probability of transition. The problem of transition is based on Schroedinger's and Heisenberg's equations of quantum mechanics, taking the perturbation in the electromagnetic field

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ACC NR: AT6024378

into account. The collision of electrons with atoms is studied using the wave function of a free electron, the atomic wave function, and the operator characterizing the Coulomb energy of an impinging electron. Various cases of the state of processes are discussed which depend upon the wave functions as well as the atom and the free electron. Orig. art. has: 7 figures and 52 formulas.   [EC]

SUB CODE: 03/ SUBM DATE: 17Mar66/ ORIG REF: 007/ OTH REF: 004/ ATD PRESS:
                                                                       5042

Card 2/2   JS

SOURCE CODE: UR/0053/66/C39/004/0824/0729

AUTHOR: Drukarev, G. F.; Sena, L. A.

ORG: none

TITLE: Third all-union conference on physics of electron and atom collisions

SOURCE: Uspekhi fizicheskikh nauk, v. 89, no. 4, 1966, 724-729

TOPIC TAGS: physics conference, electronic collision, particle collision, heavy particle, particle scatter, ionization, helium plasma, gas discharge, luminescence spectrum

ABSTRACT:

    The number of conferences devoted to the field of physics of electronic and atomic collisions reflects the increased interest in this field of science.   To date, four international and three All-Union (Soviet) conferences dealing with this subject have been held.   The most recent was the Third All-Union Conference on Electronic and Atomic Collisions held in Kharkov on 21—28 June 1965.   Three hundred delegates heard 119 reports presented by the participants.

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UDC: 539.18

ACC NR: AP6029743

The Conference was opened by a lecture by V. V. Afrosimov, Yu. S. Gordeyev, M. N. Panov, and N. V. Fedorenko from the Leningrad Physical and Technical Institute (LFTI), entitled "Ionization and scattering with characteristic energy losses in atomic collisions." They discussed the results of experiments which have shown that ionization processes as a result of collisions of multielectronic systems at energies of the order of dozens of kev are always accompanied by characteristic energy losses. According to M. Ya. Amus'ya this phenomenon can be attributed to collective oscillations of electrons in electronic shells. The report and the theoretical interpretation of the effect aroused a great deal of discussion and were discussed at a special symposium devoted to this phenomenon.

The experimental investigations presented at the Conference dealt with a wide range of problems concerning the types of interaction, energy ranges, and the types of interacting particles. The basic results of most of these studies were variations of the effective cross sections with particle velocities.

A considerable number of reports dealt with collisions of heavy particles mostly at energies ranging from approximately 10 to several

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dozen kev. The various processes investigated were ionization, excitation, stripping, resonance and nonresonance charge exchange formation of negative ions, and dissociation of molecules. V. I. Kikiani, G. N. Ogurtsov, and I. P. Flaks (LFTI) have investigated ionization and charge exchange in collisions of ions and atoms of alkali metals with inert gases, as well as with hydrogen and nitrogen at energies of 1—30 kev. It was observed that the structure of electronic shells of colliding particles exerts a considerable effect on the ionization cross section. In particular, relatively large cross sections were observed for a similar structure of electronic shells. The charge exchange cross sections increased monotonically with the velocity of ions and with the increasing atomic number, reaching values of the order of 10^{-6} cm^2 at the highest velocities. V. F. Kozlov from the Physical Technical Institute of the Academy of Sciences Ukrainian SSR (FTI AN UkrSSR) reported on the results of experiments for measuring the double charge exchange cross sections involving singly charged positive ions using combinations of interacting particles and particle energies which preclude the formation of particles in excited states. He used atomic hydrogen, lithium, sodium, and potassium ions and neutral particles consisting

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of helium, neon, argon, and molecular hydrogen atoms. The experi-
ments have shown that in the adiabatic range, the experimentally
determined effective cross sections differ from the theoretical
values.

V. A. Gusev, D. V. Pilipenko, and Ya. M. Fogel' (FTI AN
UkrSSR) have measured the cross section for the electron loss by
negative hydrogen ions in collision with O_2, NO, and CO. For
collision of H^- with CO, the dependence of the cross section on
the velocity shows a certain structure which the authors attributed
to the transfer of the electron to the CO molecule. The newly
formed negative ion may then dissociate into charged or neutral
fragments and an electron. The same authors also measured the
cross section for the formation of negative ions. Yu. F. Bydin
(LFTI) also dealt with the loss of electrons in collisions of alkali
metal ions with the atoms of inert gases. In these experiments
the energy of ions varied between 600 and 3000 ev. The results
obtained were analyzed from the point of view of the theory of inter-
action of negative ions with atoms developed by O. B. Firsov and
B. M. Smirnov.

In the research work of R. N. Il'in, V. A. Oparin, Ye. S.

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Solov'yev, and N. V. Fedorenko (LFTI), it was demonstrated that
the formation of highly excited hydrogen atoms is considerably
more effective in collisions involving charge exchange of protons
with energies up to 30 kev with the atoms of alkali metals, than in
charge exchange with the atoms of inert gases. G. F. Bogdanov,
A. N. Karkhov, and Yu. A. Kucheryayev also dealt with research
associated with controlled thermonuclear reactions in a paper
entitled "Dissociation of fast molecular ions of hydrogen and the
charge exchange of fast protons in a lithium arc." These authors
measured the cross sections for the formation of protons and hydrogen
atoms as a result of dissociation of molecular ions of hydrogen
on lithium ions as well as the cross sections for charge exchange of
protons at energies between 40 and 160 kev.

Collisions of particles with higher energies (hundreds of kev
and Mev) were investigated in a few papers presented primarily
by the members of the Laboratory of the Institute of Nuclear Physics,
Moscow State University, headed by V. S. Nikolayev, and by staff
members of the Physical and Technical Institute, Academy of
Sciences Ukrainian SSR, under the direction of L. I. Pivovar.
These reports described the results of the investigation of angular
and energy distributions of scattered particles, the formation of

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multicharged ions, and measurements of cross sections for losses and capture of e ctrons by positive and negative ions.

Development of research on low-temperature plasma requires the knowledge of cross sections for various processes at low energies down to tens of ev, which unfortunately, presents considerable difficulties to experimenters. Very few papers dealing with this low range of energies can be found in the literature. Only two reports at the Conference covered this low range, and both of these dealt with the measurements of resonance charge exchange cross-sections. In one lecture, presented by B. M. Palyukh and L. S. Savchin (Lvov University), the cross section for charge exchange of potassium and cesium at energies ranging from 100 to 3 ev was determined by the "classical" retarded field method. In the second work, V. A. Belyayev, V. G. Brezhnev, and Ye. M. Yerastov proposed an original method for measuring the cross sections based on the fact that the interacting particle beams move together with almost identical velocities.

In addition to measuring the cross sections for interactions of heavy particles, some researchers used these interactions as a means of investigation. One of the papers described a method developed for investigation of hot plasma by fast particle beams. Using the

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resonance charge exchange of hydrogen atoms on protons, V. V. Afrosimov, B. A. Ivanov, A. I. Kislyakov, and M. P. Petrov (LFTI) have measured the concentration of protons in the "Alpha" unit. L. I. Krupnik and N. G. Shulika (FTI AN UkrSSR) have analyzed the possibility of developing methods for determining the parameters of hydrogen and helium plasmas having various densities and degrees of ionization. A. B. Kamnev and V. B. Leonas, working along the same line, used small-angle scattering in atomic collision to determine the potential functions of interaction between all combinations of inert gas atoms.

Among the experimental works, the largest group of papers presented consisted of investigations of collisions (primarily inelastic collisions) of electrons with atoms and molecules. The report presented by the members of the Uzhgorod University (I. P. Zaposochnyy, L. P. Shimon, O. B. Shpenik, and others) described the results of measurements of excitation functions for alkali metal atoms, metals of the second group in the periodic table, inert gases, and nitrogen molecules. The nature of the complex structure of

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excitation functions aroused considerable discussion. While a number of peaks can be easily explained by cascade transitions, in other cases the origin of many peaks is still unexplained. According to Y. P. Bogdanova (Leningrad State University), the additional peaks in the excitation function curve for helium near the excitation threshold can be attributed to impurities.

Ionization of atoms by electron impact was the subject of investigations by G. M. Beylina, S. I. Pavlov, and V. I. Rakhovskiy (All-Union Electrotechnical Institute imeni V. I. Lenin). Using the intersecting beam method they measured the ionization cross sections of certain heavy atoms (silver, copper, lead).

A number of reports was devoted to the investigation of various processes occurring in collisions of electrons and ions with molecules accompanied by ionization, dissociation, and the appearance of excited electronic and vibrational states. In a review paper entitled "Collisions of electrons and ions with molecules," N. N. Tunitskiy considered the regularities and the collision mechanism for multiply charged ions with atoms and molecules. The author presented data on the effect of electronic and vibrational excitation on ion-molecule

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reactions. A. A. Perov, S. Ye. Kupriyanov, and N. N. Tunitskiy (Physical and Chemical Institute imeni L. Ya. Karpov), investigating the dissociation of molecular ions of hydrogen on neon, have shown that the cross section for dissociation depends on how the ions are formed. In ionization of hydrogen-containing molecules, the cross section is considerably larger than in ionization of hydrogen molecules. The authors attribute this effect to the difference in the distribution of ions obtained in various vibrational states.

G. Ye. Spezhakova, M. V. Tikhomirov, and N. N. Tunitskiy reported on the experimental investigation of ion-molecule reactions of the molecular hydrogen ion with a hydrogen molecule and with a helium atom at various energies of ionizing electrons. These results are in good agreement with the theoretical considerations based on the statistical model proposed by O. B. Firsov. The two reports by S. Ye. Kupriyanov: "Longlasting excitation states of ions and molecules and their role in collision processes" and "Formation of hydride ions of noble gases and H_3^+ ions in collisions of excited and non-excited ions and molecules, " as well as a report by V. Yu. Orlov: "Multiply charged ions in mass-spectra of some silicoorganic compounds. " also dealt with the same subje ...

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The Conference heard a number of papers in which the data on basic processes in plasma were obtained not through the study of single collisions and measurement of the corresponding cross sections, but on the basis of analysis of properties and behavior of plasma. Although the characteristics determined in such a way appear, as a rule, to be spread over all the energies, the difficulty of direct measurements at low energies makes such investigations a basic technique for obtaining information on collision processes in low-temperature plasma.

Investigations of low-temperature plasma were conducted by various methods: optical, electrical, microwave, or sometimes by using more than one of these techniques. The results of these investigations make it possible to evaluate the relative importance of individual elementary processes in plasma.

M. A. Yel'yashevich and coworkers (Institute of Physics, Academy of Sciences Belorussian SSR) have analyzed the conditions under which forbidden transitions can take place in plasma under the influence of intermolecular electric fields. The intensity of these transitions was used in determining the concentration of charged

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particles in the direct-current arc and in the pulsed discharge plasma stream. T. V. Bazhenova and Yu. S. Lobastov, using the method of microwave absorption, have investigated the plasma of gas heated by shock waves to temperatures of 2000—7000K. Using the experimental values of the electron concentration and the effective number of collisions of electrons with atoms, the author determined the cross sections for collisions in nitrogen, oxygen, CO, CO_2, and argon averaged over the velocity distribution. By measuring the optical and electrical characteristics of the discharge in mixtures of N_2 and Ar, CO and Ar, N_2 and CO, and N_2 and He, L. A. Cherenko, V. V. Kokhonenko, and N. A. Prileznayeva (Tomsk University), have determined the cross sections for collisions of the second kind involving collisions of excited atoms and molecules. Using the electrical and optical methods E. G. Gnevysheva, L. A. Luizova, V. S. Krivchenkova, and A. D. Khakhayeva have investigated the mechanism for the excitation of helium and neon in the positive discharge column.

Basic processes in a helium discharge were analyzed in the works of I. Ya. Fugol' and P. L. Pakhomov, "Investigation of the process of pair collisions of metastable atoms in helium-plasma

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afterglow at 77 and 20K, " and V. P. Chebotayev "Disintegration of
2^3S- and 2^1S-metastable atoms of helium by electrons in the positive
glow-discharge column. " Using the experimental data, the authors
of these papers evaluated the cross sections for disintegration of
metastable atoms: 2^3S atom in collision with the normal 1^1S atom
(first paper) and electrons averaged over the velocities in collision
with the electrons of 2^3S and 2^1S atoms (second paper).

Results of the investigation of low-temperature plasma and of
processes in such a plasma were also analyzed in the report of
L. M. Grechikhin and L. Ya. Min'ko, "Investigation of processes
producing luminescence in electronic discharge tubes, " in a paper
by V. M. Kaslin, G G. Petrasha, and A. A. Khaykin, "Investigation
of processes of energy transfer between the levels of a plasma in a
gas laser," in a paper by Ye. P. Ostapchenko, O. N. Oreshak, and
V. A. Stepanov, "Investigation of a discharge in mixtures of mercury—
krypton, and cadmium—xenon, " and in a paper by A. P. Motornenko,
"Investigation of electrical and spectral properties of a high-frequency.
gas discharge." Some of these and other analogous papers were the
results of research conducted in connection with problems of quantum
electronics and magneto-hydrodynamics. Other reports dealt

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with physical processes of the upper atmosphere. A very thorough
review paper was delivered by G. S. Ivanov-Kholodnyy and A. D.
Danilov entitled "Chemistry of the ionosphere," in which it was shown
how the results of laboratory experiments on the basic processes
and the research data obtained on the ionosphere should supplement
one another. This is even more necessary in view of the fact that
the laboratory data on the values of constants of basic processes
are often unreliable.

In investigating the luminescence spectra of N_2, O_2, CO, CO_2,
and NO molecules and of air, and in comparing these spectra with
the emission spectra of the same gases excited by slow electrons
and protons with energies of 37 kev, as well as with spectra of
the same gases excited by slow electrons and protons with energies
of 37 kev, as well as with spectra of auroras, Z. G. Koval', V. T.
Koppe, and Ya. M. Fogel' (FTI AN UkrSSR) came to a preliminary
conclusion that not only the fast electrons but also the slow electrons
play an important role in the excitation of auroras. Based on the
same analysis, the authors concluded that oxygen is found primarily
in the dissociated state in the atmospheric layers in which auroras
occur.

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Problems arising in astrophysics were reflected in the report by V. I. Cherednichenko (Kiev Polytechnical Institute) in which the author, using empirical relations for the charge exchange ionization, and dissociation cross sections for molecules, suggested that the most probable decay processes of CO_2 molecules in cometary atmospheres are charge exchange, dissociative charge exchange, and dissociation as a result of collisions.

Three reports at the Conference dealt with photoionization. L. V. Keldysh and six other authors described theoretical calculations and experiments on multiphoton ionization in a strong electromagnetic field at optical frequencies produced by a laser in gas under such a low pressure that the mean free path is considerably larger than the region in which the electrical field is concentrated, and thus the field affects individual atoms. M. Ye. Akopyan, F. I. Vilesov, and A. N. Terenin, presented the results of the investigation of photoionization of a number of organic molecules, including some low-volatility compounds, in the spectral region extending up to 14 ev. N. Ya. Dodonova discussed the fluorescence of NO during the photodissociation of N_2 exposed to the vacuum ultraviolet radiation at photon energies up to 11.7 ev.

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The largest number of papers, theoretical as well as experimental, was devoted to collisions of electrons with atoms. Research in this field is being conducted mainly at the Leningrad State University, the Institute of Physics of the Academy of Sciences USSR, and Institute of Physics of the Latvian Academy of Sciences. Computers were used extensively in most of these works, making it possible to include a number of previously neglected factors in the computations and also to broaden the scope of the research. Some of the papers presented and the results obtained are listed below. M. Gaylitis used the variational principle in computing the triplet and singlet phases of scattering of electrons by hydrogen atoms at the total angular momentum $L = 0$, 1, 2. The computation indicated the presence of prethreshold resonances. I. Vinkalis calculated partial cross sections for ionization of hydrogen atoms by electrons for angular momentum L 0 through 6, taking exchange, polarization, and other factors into account. E. Karule and R. Peterkop calculated the cross sections for scattering of electrons by atoms of alkali metals at energies below the excitation threshold and for excitation at energies slightly above

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ACC NR: AP6029743

the threshold (up to 5 ev). V. Veldre, L. Rabik, and A. Lyash used
the Born approximation in calculating the total effective cross sections
for excitation of neon and argon for transitions involving the first
six excited configurations. All of the above research was conducted
at the Institute of Physics, Academy of Sciences Latvian SSR.

The Leningrad University presented several papers on collisions
of electrons with atoms. In "Resonance effects in elastic scattering
of electrons on helium atoms," T. V. Zhikharev studied the behavior
of the cross section for S- and P- scattering near the excitation threshold.
At energies below the excitation threshold of the 2^3S level, resonance
is observed in the cross section when the exchange is taken into account.
This was attributed to the bound state of electrons in the field of the
excited atom. "Exchange excitation of helium atoms by electron
impact" was presented by V. F. Bratsev and V. I. Ochkur. Using
the Born-Oppenheimer equation, the authors calculated the function
for excitation of a helium atom from the ground state to the 2^3S state.

The theoretical investigations of electron collisions, conducted
at the Institute of Physics, Academy of Sciences USSR, were dis-
cussed. L. A. Vaynshteyn and L. P. Presnyakov, in "Excitation of
Atoms through an intermediate level," used the methods worked out

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ACC NR: AP6029743

with I. I. Sobel'man to calculate cross sections for a number of transitions in atoms of alkali metals for levels above the resonance level. It was established that for the transitions $n_0 S \to (n_0 + 1)P$ (where n_0 is the principal quantum number of the ground level), the cross section for a transition through an intermediate layer was considerably larger than the cross section for a direct transition. L. A. Vaynshteyn and A. V. Vinogradov, in "Ionization of an atom with simultaneous excitation of an ion in electron impact," consider processes leading to a change in state of more than one electron. Computations made in the second Born approximation have shown that the cross section for the Ar $(3p^6)^e$ process is of the same order of magnitude as the cross section for the usual ionization. I. L. Beigman, in "Cross section for ionization of ions by electron impact in the Born-Coulomb approximation," has computed cross sections for ionization of some levels of excited atoms of carbon and helium. M. A. Mazing and I. I. Sobel'man have demonstrated the possibility of estimating an effective cross section for inelastic interactions of electrons with excited atoms by measuring the width and shifts of spectral lines in plasma. Using experimental data, they determined effective cross sections for a number of transitions between the excited levels of He, Ne, and Ar^{++}.

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ACC NR: AP6029743

A considerable number of theoretical papers was devoted to collisions of heavy particles. Some of these dealt with the investigation of resonance and nonresonance charge exchange. G. V. Dubrovskiy and V. D. Ob'yedkov (Leningrad State University) have analyzed endothermic reactions of the type $A^+(^1S) + B(^1S) \rightarrow A(^1S) + B^+(^2P) - \Delta E$ in the energy range of 1—2 kev. A particular characteristic of this process was a strong polarizational interaction of particles in the final state. On the basis of results obtained, the authors have computed the cross section for the charge exchange of alkali metal ions with the atoms of inert gases. Ye. Ye. Nikitin (Institute of Chemical Physics) has developed a theory of nonresonance charge exchange for multiply charged ions, which takes into account the Coulomb interaction. The solution was obtained in the two-level approximation using the exact asymptotic form of electronic wave functions. The results make it possible to clarify the limits of applicability of various theories of nonresonance charge exchange. Yu. Ye. Murakhver (Leningrad State University) computed the angular distribution of resonance charge exchange of helium atoms and ions. Calculations of differences in the trajectory for the symmetric and the antisymmetric states of the quasi-molecules performed in the quasi-classical approximation lead to a smoothing of oscillations.

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Yu. N. Demkov developed a theory of electron stripping during a slow collision of a negative ion with an atom when, as the nuclei approach each other, the bound state merges with the continuous spectrum.

Papers on the calculation of various processes of ionization and excitation in atomic and atom-molecular collisions were presented. A. V. Vinogradov and I. A. Poluektov (Physics Institute of the Academy of Sciences) presented a paper on "Excitation of atoms by neutral particles," in which they discussed calculations of cross sections for excitation of a hydrogen atom in a collision with a nitrogen molecule and a hydrogen atom. A. D. Derbeneva (Academy of Sciences Tadzhik SSR) delivered a paper entitled "Cross sections for ionization and cross sections for diffusion of Fe, Ca, Si, and Mg with 0 and N at 0.4—1.5 kev." Yu. Sazhinev and Yu. V. Bulgakov presented a paper on "Computation of the cross section for dissociation of the H_2^+ ion in collision with a hydrogen atom."

Quite a few papers also dealt with general theoretical problems and new methods of computation. [FSB: v. 2, no. 11]

SUB CODE: 20 / SUBM DATE: none

Card 19/19

DRUKAREV, I.L., assistent

Allergic changes in the liver under the influence of homologous placental protein. Trudy LSGMI 18:33-43 '55.   (MIRA 14:3)

1. Leningradskiy sanitarno-gigiyenicheskiy meditsinskiy institut, kafedra akusherstva i ginekologii.
        (ALLERGY)   (LIVER)   (PROTEINS)

DRUKAROVA, D. I.

"Metallic Alloys, Stable in Hydrochloride Media," Zhur. prik. khim., No.1, 1949.

All-Union Sci.Res.Inst. Chemicopharm. im. Ordzhonikidze

ALYSHBAYEV, Dzhumagul Alyshbayevich; DRUKER, Boris Aronovich; YERINA,
    V.M., otv. red.; KOVAL'CHUK, V.V., red. izd-va; ANOKHINA, M.G.,
    tekhn. red.

 [Problems in the development and distribution of the most
 important branches of industry in Kirghizistan]Voprosy razvi-
 tiia i razmeshcheniia vazhneishikh otraslei promyshlennosti
 Kirgizii. Frunze, Izd-vo Akad. nauk Kirgizskoi SSR, 1962. 29 p.
             (MIRA 15:9)
   (Kirghizistan--Industries, Location of)

ALYSHBAYEV, D.A., nauchn. sotr.; GUSHCHIN, A.F., nauchn. sotr.;
ABDURAKHMANOV, I., nauchn. sotr.; MEL'NIKOV, A.A., nauchn.
sotr.; DRUKER, B.A., nauchn. sotr.; IMANALIYEV, M., nauchn.
sotr.; YESIPOV, N.S., otv. red.; SEMIKINA, T.F., red.izd-va;
POPOVA, M.G., tekhn. red.

[Prospects for the development and distribution of the most
important branches of the Kirghiz industry] Perspektivy raz-
vitiia i razmeshcheniia vazhneishikh otraslei promyshlennosti
Kirgizii. Frunze, Izd-vo AN Kirg.SSR, 1963.   154 p.
                                        (MIRA 16:7)

1. Akademiya nauk Kirgizskoy SSR Frunze. Institut ekonomiki.
2. Institut ekonomiki AN Kirg.SSR (for all except Yesipov,
Semikina, Popova).
          (Kirghizistan--Industries, Location of)

DRUKER, I.G.(Novosibirsk)

Deposition of readily soluble salts on the walls of steam
generating pipes. PMTF no. 6:157-160 N-D '63. (MIRA 17:7)

ACC NR: AP6013930   (N)   SOURCE CODE: UR/0207/66/000/002/0109/0113

AUTHOR: Druker, I. G. (Novosibirsk)   28
                                                                              B

ORG: none

TITLE: Lift on a contour in a plane uniformly vortical stream of incompressible ideal fluid

SOURCE: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 2, 1966, 109-113

TOPIC TAGS: plane flow, incompressible fluid, inviscid flow, ideal fluid

ABSTRACT: The author considers plane flow of a uniformly vortical stream of incompressible inviscous fluid around a contour. A method is derived for calculating the lift on contours which have central or axial symmetry which reduces lift determination to the ordinary problem of potential flow around the given contour. An example is given illustrating application of the proposed method in calculating the lift on an elliptical plate located in a uniformly vortical stream of ideal fluid at a given angle of attack. It is shown that the maximum lift occurs when the plate is perpendicular to the flow. Orig. art. has: 2 figures, 27 formulas.

SUB CODE: 20/   SUBM DATE: 05May65/   ORIG REF: 003/   OTH REF: 000

Card 1/1 hV

MERKIN, I.B., inzh.; DRUKER, M.M., inzh.

Purification of dusted air in casting houses by water atomization.
Mashinostroenie no.3:43-44 My-Je '64.

(MIRA 17:11)

DRUKER, Z. I.

112-1-950

Translation from: Referativnyy Zhurnal, Elektrotekhnika, 1957, Nr 1, p. 153 (USSR)

AUTHOR: Druker, Z. I.

TITLE: Highly Efficient Magnetizing System (Namagnichivayushchaya ustanovka bol'shoy proizvoditel'nosti)

PERIODICAL: Sb. rats. predlozheniy. M-vo elektrotekhn. prom-sti SSSR, 1955, Nr 57, pp. 16-17

ABSTRACT: A description of a pulse capacitor installation for magnetizing the permanent magnets of bicycle dynamo rotors is given. The installation consists of a bank of 1800-mf, 450-v capacitors, an ignitron of the $И50/1500$ type, and a magnetizing yoke made of ARMKO steel and of its winding, consisting of one turn of a conductor of 6 to 8-sq mm cross section. Ignitrons in this system perform the role of switches connecting the battery of capacitors with the magnetizing coil. In the beginning the installation accumulates electric energy in the capacitor bank by charging from the d-c network or from the a-c network through a selenium rectifier, and after this energy is discharged through the ignitron into the winding of the magnetizing yoke. A large emission from the ignitron cathode during the ignitron's ignition makes possible

Card 1/2

Highly Efficient Magnetizing System (Cont.)   112-1-950

the passage of very high currents measured in thousands of amperes almost without energy losses. The arrangement permits the creation of a magnetic field of very high intensity. The magnetizing occurs almost instantaneously and its time is measured in parts of a second. The discharge current attains 4000 amperes. The installation has operated successfully in the course of a year and several thousand switchings are made with it daily.

Card 2/2

                                                    V.A.I.

DRUKER, Z.I

AUTHOR: Druker, Z.I.   115-5-18/44

TITLE: A Universal Device for Checking of Pyrometrical Instruments
            (Universal'naya ustanovka dlya poverki pirometricheskikh
            priborov)

PERIODICAL: "Izmeritel'naya Tekhnika", No 5, Sep-Oct 1957, pp 37-39 (USSR)

ABSTRACT: The universal device, designed and built at the laboratory for
            electric measurements of the plant "Dinamo" imeni Kirov, serves
            for checking pyrometrical instruments, such as millivolt-
            meters, logometers, automatic bridges and potentiometers,
            thermocouples, and resistance thermometers, as well as contact
            groups in control devices. The following measuring instruments
            are contained in the device: potentiometer "ППТН-1", which is
            used with additional elements and batteries; electronic
            potentiometer "ЭПД" of class 0.5; bridge"МВЛ-47" of class
            0.5; special lever magazines for checking of logometers and
            automatic bridges; a combines device for checking the accuracy
            of operation of control contacts. Detailed technical character-
            istics of all aforementioned instruments are given. The
            electronic potentiometer "ЭПД", a lever magazine, and a com-
            bined checking device for control contacts are also illustrat-
Card 1/2   ed by schematic diagrams. In conclusion it is stated that the

A Universal Device for Checking of Pyrometrical Instruments   115-5-18/44

   described device is more convenient and efficient than con-
   ventionally applied instruments and methods of checking.
   The article contains 3 schematic diagrams.

AVAILABLE: Library of Congress

Card 2/2

VORONTSOV, B.N.; PEREL'SHTEYN, Ye.L; DONDE, Yu.Ya.; DRUKER, Z.I.

New principles for determining the compulsion of official
testing of measuring instruments. Izm.tekh. no.5:58-61
My '61.
(MIRA 14:5)

1. Zamestitel' Nachal'nika TSentral'noy izmeritel'noy laboratorii
Gor'kovskogo avtomobil'nogo zavoda (for Vorontsov). 2. Nachal'nik
laboratorii elektricheskikh izmereniy zavoda DINAMO imeni S. M.
Kirova (for Druker).

(Measuring instruments--Testing)

DRUKER, Z.

Regulations on planned and preventive repair of electric instruments published by the Central Research Institute for Instruments of the Electric Equipment Industry ih subscription series TS-4. Izm.tekh. no.2:56 F '64.
(MIRA 17:4)

1. Glavnyy metrolog Moskovskogo zavoda "Dinamo" imeni Kirova.

DRUKIN, E.Ya.

Treatment of multiple myeloma with sarcolysine, ACTH and prednisone; 2 observations. Vcp, onk, 11 no.8:95-97 '65.
(MIRA 18:11)

1. Iz khirurgicheskogo otdeleniya Kostromskogo onkologicheskogo dispansera (glavnyy vrach – zasluzhennyy vrach RSFSR R.V. Kublitskiy).

DRUKKER, S. A.

1949. "High Ohmic Resistance for Vacuum Tube Amplifiers". Zavodskaya Laboratoriya, No. 10,

Sci-Res Cinephoto Inst.

SO: Translation W-8814, 14, Mar 1950.

DRUKKER, S. A.

USSR/Engineering - Pyrometry, Instruments   Nov 50

"New Variation of the Method for Controlling Spectrum
Composition by the Blue-Red Ratio," S. A. Drukker,
Sci Res Inst of Cinematography

"Zavod Lab" No 11, pp 1342-1348

New method for measuring temp is combination of blue-
red ratio method with phenomenon of luminescence. It
is based on using luminophor of inertialess type which
transforms radiation of blue part of spectrum into
orange-red radiation. Method is visual, but uses,

180T51

USSR/Engineering - Pyrometry, Instruments   Nov 50
                 (Contd)

instead of color-distinctive capacity of the eye,
its contrast sensitivity to one-colored fields of
comparison. Describes inst constructed on principle
of this method.

180T51

DRUKKER, S. A.

"Control of the spectrum Composition of Illumination During Colored Motion-Picture Filming." Sub 8 Mar 51, Sci Res Cinephotographic Inst (NIKFI), Ministry of Cinematography USSR

Dissertations presented for science and engineering degrees in Moscow during 1951.

SC: Sum. No. 480, 9 May 55

DRUKKER, S. A. (Bch. of Eng. Sci.)

PHASE I   Treasure Island Bibliographic Report

BOOK

Authors: Ch. I - LEVINGTON, A. L. and PROVOZOV, F. F.
    Ch. II - GOLOSTENOV, G. A., Bch. of Eng. Sci., and DERBISHER, T. V. Eng.
    Ch. III - FELL', V. G., Bch. of Eng. Sci., and RABINOVICH, Kh. A. Eng.
    Ch. IV & V - DRUKKER, S. A., Bch. of Eng. Sci.
    Ch. VI - FELL', V. G., Bch. of Eng. Sci.
    Ch. VII - OSKOLKOV, I. N., Bch. of Eng. Sci., and SOKOLOV, S. A. Eng.
    Ch. VIII - RADCHIK, B. I., Eng.
    Ch. IX - GORDIYCHUK, I. B.
    Ch. X - TOLMACHEV, V. A., Eng.

Call No.: AF546504

Full Title: TECHNIQUE OF CINEMATOGRAPHY
    Series: Accomplishments of Soviet Cinema Technique
Transliterated Title: Kinos'emochnaya tekhnika
    Seriya: Dostizheniya sovetskoy kinotekhniki

Publishing Data
    Originating Agency: None
    Publishing House: State Publishing House of Cinematographic Literature (Goskinoizdat)
    Date: 1952   No. pp.: 462   No. copies: 10,000
Editorial Staff
    Editor: None
    Ed.-in-Chief: Goldovskiy, E. M.,   Tech. Ed.: None
        Dr. of Technical Sciences   Appraiser: None

Card 2/2

Full Title: TECHNIQUE OF CINEMATOGRAPHY   Call No.: AF546504
      Series: Accomplishments of Soviet Cinema Technique

Text Data
   Coverage: The book is the fourth in the series "Accomplishments of Soviet
               Cinema Technique" and describes the basic methods of taking colored
               motion pictures. The technique for black-white photography was given
               in the three previous books. A description of the combined and special
               types of production now adopted in Soviet cinema studios and the technique
               of cinema stage settings will be published in one of the following issues
               of the series.
                    The book primarily describes the lighting equipment, lenses and
               deflectors, electric power units for light effects, and arrangements for
               color-photographic balances of different intensities. The book also
               gives brief data on: apparatus for normal and synchronic methods of
               taking pictures; narrow and broad films; tripods of various types;
               controlling method and mechanisms in cinematographic apparatuses.
   Purpose: General information for wide circle of specialists in motion pictures.
   Facilities: Scientific Research Institute for Motion Pictures and Photography
               (N.I.K.F.I.); cinema-studios in Moscow and Leningrad regions.
No. Russian References: None
Available: A.I.D., Library of Congress.

IRUKHER, Simon Aronovich; ZHERDETSKAYA, N.N., redakter; SHILINA, Ye.I.,
tekhnicheskiy redakter.

[Light sources and lighting in color photography] Istochniki
sveta i osveshchenie v tsvetnoi fotografii. Moskva, Gos. izd-vo
"Iskusstve", 1956. 247 p.   (MIRA 9:5)
(Color photography) (Photography—Lighting)

S/196/62/000/002/010/023
E194/E155

AUTHOR: Drukker, S.A.

TITLE: A photoelectric brightness meter

PERIODICAL: Referativnyy zhurnal, Elektrotekhnika i energetika,
no.2, 1962, 3-4, abstract 2V 20. (Svetotekhnika.
no.7, 1961, 1-10).

TEXT: A new portable brightness meter type ЯКП (YaKP) for
measuring the brightness of cinema screens and other illuminated
surfaces has been developed in NIKFI (Moscow). The optical part
of the instrument consists of a short-focus lens (F = 100 mm)
permanently focussed to a distance of 10 m, a vacuum photocell
with bismuth-silver-caesium cathode, a correcting light filter
and a view-finder tube with a magnification of X 1.6. The
photocell current is applied to the input of a single-stage
balanced d.c. amplifier; a galvanometer calibrated in units of
brightness is connected to the output. The instrument is
supplied by a battery type БАС-Г-60 (BAS-G-60). The brightness
meter sensitivity is 580 divisions per nt-strad with a

Card 1/2

A-U Sci Res Cine-Photo Inst.

DRUKKER, S.A., kand.tekʻn.nauk

"Color in nature and technology" by G.I. Ashkenazi. Reviewed by
S.A. Drukker. Svetotekhnika 7 no.10:30-31 O '61.   (MIRA 14:9)
·Color)
(Ashkenazi, G.I.)

D R...   I. .. ..

111-58-7-15/27

AUTHORS: Shchekin, G.A.,Head of the Laboratory; Pavlov, A.V.,Labora-
tory Engineer; Drukker, Ye.M., Chief of Long-Line Communica-
tions Services; Gerkulesov, A.D.,Assistant Shift Chief

TITLE: The Practice of Using Telegraph Communications Without a
Transmission Regulating Apparatus (Opyt eksplratatsii tele-
grafnykh svyazey bez'kontrol'nogo apparata peredachi) In
the Leningrad Central Telegraph Office (Na Leningradskom
tsentral'nom telegrafe)

PERIODICAL: Vestnik svyazi, 1958, Nr 7, pp 22-24 (USSR)

ABSTRACT: At the beginning of 1957, the Leningrad Central Telegraph
Office decided to transmit telegrams without using a monito-
ring apparatus. For this purpose, the operators were equipped
with STA apparatus; the receiver and re-perforator were plug-
ged into the reception channel and the transmitter and tape-
killer into the transmission channel (Figure 2). An ST-35
apparatus was distributed between every 5 tables, capable of
being switched into any of them for the purpose of carrying
out a technical and operational check. The periodic checking
system between offices, based on a comparison of the perfo-
rated feed tape with the receiver telegram, is described in

Card 1/2

111-58-7-15/27

The Practice of Using Telegraph Communications Without a Transmission Regulating Apparatus In the Leningrad Central Telegraph Office

detail. A study was made of the mistakes and defects in telegrams issued within the space of one hour from various offices, with and without transmission regulation. This study revealed that the use of a regulating apparatus was not justified. The operator, faced with working both transmitting and receiving equipment, cannot cope efficiently with them both, thus causing errors.
There are 2 circuit diagrams and 2 photos.

ASSOCIATION: Leningradskiy tsentral'nyy telegraf (Leningrad Central Telegraph Office)

1. Telegraph systems—Operation   2. Monitors—Applications

Card 2/2

24.3000

75335
SOV/57-29-10-12/18

AUTHOR: Vavilin, Ye. I., Vagner, S. D., and Drukman, A. M.

TITLE: Characteristics of a High-Frequency Mercury Discharge
               in a Constant Magnetic Field

ABSTRACT: The paper gives the results of an experimental study of
               the effect of a longitudinal constant magnetic field on
               a high-frequency mercury discharge. The same two-probe
               method is used as that employed by all other investi-
               gators, and the results obtained are compared with
               those obtained by the optical photometric method. The
               latter method consisted in measuring the intensity of
               the 4916A line when the magnetic field is on, and
               when it is switched off. The frequency is 7.5 mega-
               cycles, and the voltage is measured with an electro-
               static voltmeter connected to a capacitive divider.
Card 1/3   The spectrometer is of the PS-2 (ПС-2) type set

Characteristics of a High-Frequency Mercury   75335
Discharge in a Constant Magnetic Field   SOV/57-29-10-12/18

longitudinally with the chamber. A ten-step reducer
recorded the intensity marks. The magnetic field
intensity varied between 0 and 68 oersteds, and the
mercury gas pressure varied between 0.5×10^{-3} and
8.9×10^{-3} mm Hg. The results have shown that the
electronic temperature drops with the increase in the
intensity of the magnetic field and with the decrease
in mercury gas pressure. As the magnetic field
intensity increases, so also increases the concentra-
tion of charged particles over the entire cross section
of the tube. The concentration reaches its maximum
at a gas pressure at which the electron mean free
path is much greater than their mean Larmor radii,
whether or not the magnetic field is on. When there
is no magnetic field the density of the gas current
at the walls of the tube is not affected by changes
in pressure; just as soon, however, as the field is
switched on, the gas density sharply increases. The
magnetic field also decreases the transverse electrical

Card 2/3

8(3)   SOV/91-59-6-2/33

AUTHORS: Engel', G.A. and Drukman, R.B., Engineers

TITLE: On the Tables of Permanent Personnel Strength on the
                Lines of 35-220kv Power Networks

PERIODICAL: Energetik, 1959, Nr 6, pp 4-5   (USSR)

ABSTRACT: This article presents the results of a study on the
                utilization of maintenance personnel on 35-220kv
                power lines, conducted by the OGRES in 18 network
                districts. The study revealed a lack of uniformity
                in allocating personnel and showed that up to
                16.5% of the total work time used is spent on work
                outside of assigned duties, such as on the new con-
                struction and reconstruction projects. The down time,
                time spent on travel to place of work, on handling
                supplies, etc., amounted to 23.5% of the total. The
                creation of mechanized repair stations (RMS) and a
                series of technical improvements in servicing the
Card 1/2   lines, combined with better utilization of available

SOV/91-59-6-2/33

On the Tables of Permanent Personnel Strength on the Lines of
35-220kv Power Networks

maintenance personnel, would permit a drop of
550 repairmen and 20 foremen in 18 districts alone.
The work norms should specify that one repairman
service 26 km of the power network, one foreman
225-280 km of the power network, which would result in
an increase of labor productivity by 25%. In areas
difficult to traverse, the above length of power
line per worker must be reduced by 20%. In a footnote,
the editing office invites the readers to make their
suggestions on the above matter.

Card 2/2

DRUKMAN, R.B., inzh.; ENGEL', G.A., inzh.

Changes in "Overhead electric power transmission lines" of the new
"Regulations for operating electric power plants and electric net-
works." Energetik 9 no.7:28-30 Jl '61.   (MIRA 14:9)
    (Electric lines--Overhead) (Electric power distribution)

DRUKMAN, R.B., inzh.; ENGEL', G.A., inzh.

"Grounding systems" from the new "Regulations for operating electric networks and power plants." Energetik 9   no.8:30-31 Ag '61.   (MIRA 14:8)
        (Electric power distribution) (Electric power plants)